

MANUAL

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INTEGRATED SAFETY MANAGEMENT SYSTEM MANUAL



U. S. DEPARTMENT OF ENERGY
Washington, DC

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INITIATED BY:
Office of Environment,
Safety and Health

INTEGRATED SAFETY MANAGEMENT SYSTEM MANUAL

1. PURPOSE. The purpose of this Manual is to clearly identify and institutionalize DOE requirements and responsibilities regarding development and implementation of Integrated Safety Management (ISM) systems in DOE program and field offices and for assessment of ISM implementation. This Manual also provides requirements for contractors to perform annual reviews and summary evaluations of ISM effectiveness. In addition, the Manual provides guidance for implementation of these requirements.
2. CANCELLATION. None
3. APPLICABILITY. This Manual applies to all DOE elements, and all contractors that must comply with DEAR 970.5223-1, *Integration of environment, safety, and health into work planning and execution*.
4. REFERENCES.
 - a. DOE P 450.4, *Safety Management System Policy*, dated 10-15-96.
 - b. DEAR 970.5223-1, *Integration of environment, safety, and health into work planning and execution*.
 - c. DOE G 450.4-1B, *Integrated Safety Management System Guide*, dated 3-1-01.
 - d. DOE-HDBK-3027-99, *Integrated Safety Management Systems Verification Team Leader's Handbook*, June 1999.
 - e. DOE M 411.1-1C, *Safety Management Functions, Responsibilities, and Authorities Manual*, dated 12-31-03 (DOE FRAM).
 - f. DOE P 450.7, *Environment, Safety and Health (ESH) Goals*, dated 8-2-04.
 - g. DOE O 226.1, *Implementation of Department of Energy Oversight Policy*, dated 9-15-05;
 - h. DOE O 450.1, *Environmental Protection Program*, dated 1-15-05.
 - i. DOE G 450.1-1A, *Implementation Guide for Use with DOE O 450.1, Environmental Protection Program*, dated 10-24-05.
 - j. DOE G 450.1-2, *Implementation Guide for Integrating Environmental Management Systems into Integrated Safety Management Systems*, dated 8-20-04.
 - k. DOE P 450.2A, *Identifying, Implementing and Complying with Environment, Safety and Health Requirements*, dated 5-15-96.
 - l. DOE O 414.1C, *Quality Assurance*, dated 6-17-05.

5. CONTACT. Direct requests for additional information to the Office of Environment, Safety and Health, (301) 903-3568.

SAMUEL W. BODMAN
Secretary of Energy

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(TO BE GENERATED LATER)

CHAPTER I. OVERVIEW AND RESPONSIBILITIES

1. **INTRODUCTION.** The purpose of this Manual is to clearly identify and institutionalize DOE requirements and responsibilities regarding development and implementation of Integrated Safety Management (ISM) systems in DOE Secretarial offices and field offices and for assessment of ISM implementation. This Manual provides requirements for DOE and contractors to ensure development and implementation of an effective ISM system that is consistently approved and reviewed, and continuously improved. In addition, the Manual provides guidance for implementation of these requirements.

The objective of ISM is to perform work in a safe and environmentally sound manner. More completely, as described in DOE P 450.4, *Safety Management System Policy*: “The Department and Contractors must systematically integrate safety into management and work practices at all levels so that missions are accomplished while protecting the public, the worker, and the environment. This is to be accomplished through effective integration of safety management into all facets of work planning and execution. In other words, the overall management of safety functions and activities becomes an integral part of mission accomplishment.” In ISM, the term “safety” is used synonymously with environment, safety, and health (ES&H) to encompass protection of the public, the workers, and the environment.

Throughout this Manual, ISM is defined to include applicable integration with Environmental Management System (EMS) and Quality Assurance Program (QAP). Requirements for this integration exist in related directives such as the integration of EMS per DOE O 450.1, *Environmental Protection Program*, and the integration of QAP per DOE O 414.1C, *Quality Assurance*.

The Department developed and began implementation of ISM in 1996. Since that time, the Department has gained significant experience with its implementation. This experience has shown that the basic framework and substance of the Department’s ISM program remains valid. The experience also shows that substantial variances exist across the complex regarding familiarity with ISM, commitment to implementation, and implementation effectiveness. The experience also shows that more clarity on DOE’s role in effective ISM implementation is needed. Contractors and DOE alike have reported that more clear expectations and guidance on annual ISM maintenance and improvement processes are needed.

Since 1996, external organizations that are also performing high-hazard work, such as commercial nuclear organizations, navy nuclear organizations, National Aeronautics and Space Administration, and others, have also gained significant experience and insight relevant to safety management. The ISM core function of “feedback and improvement” calls for DOE to learn from available feedback and make changes to improve. This concept applies to the ISM program itself. Lessons learned from both internal and external operating experience are reflected in this Manual to update the ISM program. Two significant sources of external lessons learned have contributed to this Manual: (1)

the research and conclusions related to High-Reliability Organizations (HROs), and (2) the research and conclusions related to the Human Performance Improvement (HPI) initiatives in the commercial nuclear industry, the nuclear navy, and other organizations. HRO and HPI tenets are very complementary with ISM and serve to extend and clarify the program's principles and methods.

As part of the ISM revitalization effort, the Department wants to address known opportunities for improvement based on DOE experience, and integrate the best elements of HRO and HPI lessons into the Department's existing ISM infrastructure. This Manual should be viewed as a natural evolution of the ISM program, using feedback for improvement of the ISM program itself. The Department wants to integrate the ISM Core Functions, ISM Principles, HRO Principles, HPI principles and methods, lessons learned, and external best safety practices into a proactive safety culture where: (1) safety is a clear priority in every activity, (2) everyone understands their safety responsibilities and considers safety a personal obligation, (3) organization systems and processes provide added assurance that hazards are controlled and human errors are minimized and mitigated, and (4) continuous learning and improvement is expected and consistently achieved. The revitalized ISM system is expected to define and drive desired safety behaviors and ultimately to help DOE and its contractors create a world-class safety culture.

2. SCOPE.

- a. This Manual applies to the DOE elements and contractors responsible for performing safety management functions, including direction, support, and oversight, throughout the DOE complex, including the National Nuclear Security Administration (NNSA).
- b. This Manual does not apply to:
 - (1) the Naval Nuclear Propulsion Program, and
 - (2) the Power Marketing Administration.

3. CHANGE CONTROL.

- a. This document is expected to change as the Department incorporates lessons learned and continuous improvement initiatives, and will be updated as required. Changes to this Manual must be made through the DOE Directives System. However, the Secretary may override or change responsibilities in this Manual through Secretarial memoranda. Any changes made by Secretarial memoranda to the responsibilities documented in this Manual must be documented in the next update of the Manual.
- b. In the event that responsibilities documented in this Manual conflict with responsibilities defined in enacted Congressional legislation, Executive orders, or Federal regulations, the provisions of those documents override this document. If

any such conflicts are discovered, please notify the Office of Environment, Safety and Health of the need to update this Manual. In additions, conflicts with other DOE notices or orders need to be evaluated. If any such conflicts are identified, please notify the Office of Environment, Safety and Health of the need to evaluate the conflict, provide interpretations if necessary, and initiate any resulting changes or clarifications.

4. REFERENCES.

- a. DOE O 450.1, Environmental Protection Program, dated 1-15-05.
- b. DOE G 450.1-1A, Implementation Guide for Use with DOE O 450.1, Environmental Protection Program, dated 10-24-05.
- c. DOE G 450.1-2, Implementation Guide for Integrating Environmental Management Systems into Integrated Safety Management Systems, dated 8-20-04.
- d. DOE P 450.2A, Identifying, Implementing and Complying with Environment, Safety and Health Requirements, dated 5-15-96.
- e. DOE O 414.1C, *Quality Assurance*, dated 6-17-05.
- f. DOE P 450.4, *Safety Management System Policy*, dated 10-15-96.
- g. DEAR 970.5223-1, Integration of environment, safety, and health into work planning and execution.
- h. DOE G 450.4-1B, Integrated Safety Management System Guide, dated 3-1-01.
- i. DOE-HDBK-3027-99, Integrated Safety Management Systems Verification Team Leader's Handbook, June 1999.
- j. DOE M 411.1-1C, Safety Management Functions, Responsibilities, and Authorities Manual, dated 12-31-03 (DOE FRAM).
- k. DOE P 450.7, Environment, Safety and Health (ESH) Goals, dated 8-2-04.

5. RESPONSIBILITIES.

- a. Secretary of Energy.
 - (1) Establish policy and communicate expectations to ensure the safe and environmentally sound operation of Department facilities.
 - (2) Maintain a broad awareness of the status of ISM implementation throughout the Department, and take necessary actions to improve implementation effectiveness.

- b. Deputy Secretary of Energy.
 - (1) Establish policy and communicate expectations to ensure the safe operation of Department facilities.
 - (2) Establish and approve DOE safety goals and objectives.
 - (3) Review and approve the ISM system description for the Office of Environment Safety and Health.
 - (4) Maintain a broad awareness of the status of ISM implementation throughout the Department, and take necessary actions to improve implementation effectiveness.
 - (5) Designate the DOE ISM Champion to lead the DOE ISM Champions Council (See Attachment 6).
- c. Administrator of National Nuclear Security Administration (NNSA) and Under Secretary of Energy, Science, and Environment (ESE).
 - (1) Establish policy and communicate expectations to ensure the safe operation of Department facilities.
 - (2) Establish and approve safety goals and objectives for their organization.
 - (3) Maintain a broad awareness of the status of ISM implementation throughout their organization, and take necessary actions to improve implementation effectiveness.
- d. Central Technical Authorities. (Note: The Secretary established the NNSA Principal Deputy Administrator and the Undersecretary of ESE as Central Technical Authorities by memo on April 26, 2005, and directed that their responsibilities be reflected in the next revision of the DOE FRAM).
 - (1) Review and approve Secretarial office ISM systems, as described in ISM system descriptions.
 - (2) Review annual ISM reviews, declarations, and performance objectives for both headquarters Secretarial offices and field offices.
 - (3) Provide observations and recommendations to line organizations to improve ISM effectiveness.
 - (4) Direct efforts to create the necessary environment for effective ISM implementation and ultimately achieve and sustain a strong organizational culture that consistently and effectively supports safe, highly reliable operations.

- e. Secretarial Officers. (Note: This applies to those Secretarial offices that perform work activities required for successful implementation of ISM.)
- (1) Develop, approve, maintain, and implement Secretarial office ISM systems, as described in ISM system descriptions, which are complete, accurate and up-to-date; provide Secretarial office ISM system descriptions to the Central Technical Authority for final approval.
 - (2) Review and approve field office ISM systems, as described in their ISM system descriptions, for assigned field offices. (Note: This responsibility may be delegated after initial approval of the DOE field office ISM system description).
 - (3) Integrate EMS and QAP into Secretarial office and field office ISM systems, pursuant to DOE O 450.1, *Environmental Protection Program*, and DOE O 414.1C, *Quality Assurance*.
 - (4) Perform self-assessments of implementation of approved Secretarial office ISM systems such that ISM processes are evaluated on an annual basis.
 - (5) Conduct line oversight of the implementation of ISM at field offices assigned to the Secretarial office, consistent with the requirements and guidance of DOE Order 226.1, *Implementation of Department of Energy Oversight Policy*, and Attachment 5 of this Manual, *Guidelines for Improving DOE ISM System Implementation*.
 - (6) Perform an annual integrated review of the site level annual ISM reviews and declarations submitted by field offices. per Attachment 5 of this manual., *Guidelines for Improving DOE ISM System Implementation*.
 - (7) Issue an annual declaration of the status of ISM implementation within the Secretarial office to the next level of DOE management (DS for EH, and CTAs for NNSA, EM, NA, and SC).
 - (8) Prepare and submit annual safety performance objectives, measures, and commitments, for approval by the cognizant Central Technical Authority.
 - (9) Identify a Secretarial office ISM Champion to provide focus and leadership in fulfilling the Secretarial office ISM responsibilities, and for improving the effectiveness of ISM implementation.
 - (10) Use results from annual ISM reviews and declarations to drive ownership and improvement by providing clear, timely, and accurate feedback, including identifying new goals and directions for improvement in the following year, inputs to the annual planning and budgeting cycle, goal setting as in the DOE Management Challenges, and performance appraisals, to DOE personnel.

- f. Field Office Managers. (Note: the term “field office” is used throughout to indicate the DOE field office with direct management and oversight of operational activities, which may be performed by contractors or Government-Owned, Government-Operated (GO-GO) facilities. “Field offices” may have various other designations, including operations office, site office, and project office).
- (1) Develop, approve, maintain, and implement field office ISM systems, as described in ISM system descriptions, which are complete, accurate and up-to-date; provide field office ISM system descriptions to the applicable Secretarial office for final approval.
 - (2) Integrate EMS and QAP into the field office ISM system, pursuant to DOE O 450.1, *Environmental Protection Program*, and DOE O 414.1C, *Quality Assurance*.
 - (3) Perform self-assessments of implementation of approved field office ISM systems such that ISM processes are evaluated on an annual basis.
 - (4) Review and approve the Contractor’s ISM system description.
 - (5) Conduct line oversight of the field office’s contractor implementation of ISM, consistent with the requirements and guidance of DOE Order 226.1, *Implementation of Department of Energy Oversight Policy*.
 - (6) Perform an annual integrated review of the contractor annual ISM reviews and declarations submitted by the field office’s contractor organizations.
 - (7) Make an annual declaration in writing of the status and effectiveness of ISM implementation within the field office and the contractor’s organizations.
 - (8) Prepare and submit annual field office safety performance objectives, measures, and commitments, for approval by the DOE Secretarial office.
 - (9) Identify a field office ISM Champion to provide focus and leadership in fulfilling the field office ISM responsibilities, and for improving the effectiveness of ISM implementation.
 - (10) Use results from annual ISM review and summary evaluation to drive ownership and improvement by providing clear, timely, and accurate feedback, including performance appraisals and contract award fee determination, to DOE personnel and contractor organizations.

g. Contracting Officer.

- (1) Review and approve contractor ISM system descriptions and annual updates. (Note: This responsibility may not be transferred to the contractor after initial approval).
- (2) Establish and maintain the latest version of the following Department of Energy Acquisition Regulations (DEAR Clauses) in applicable DOE contracts: 48 CFR 970.5223-1, "Integration of environment, safety, and health into work planning and execution," 48 CFR 970.5204-2 (Laws, Regulations and DOE Directives), 48 CFR 970.5215-3 (Conditional Payment of Fee, Profit, and other Incentives) and 48 CFR 970.5203-2 (Performance Improvement and Collaboration).
- (3) Establish and maintain the latest version of this Manual (see Attachment 2, Contractor Requirements Document) as a requirement in all DOE contracts that already include DEAR Clause 970.5223-1, "Integration of environment, safety, and health into work planning and execution.
- (4) Provide annual direction to contractors on ISM including schedule for completing contractor submittals of (1) annual evaluation reviews and annual declaration on ISM effectiveness, (2) ISM system description updates, and (3) safety performance objectives, measures, and commitments.
- (5) Provide contractors with the latest approved version of the applicable DOE field office ISM system description.
- (6) Review and approve contractor ISM system performance objectives, measures, and commitments.

h. Director, Office of Independent Oversight and Performance Assurance.

- (1) Perform periodic independent oversight of ISM implementation at all levels (i.e., DOE headquarters Secretarial offices, DOE field offices, and DOE contractors).
- (2) Provide observations and recommendations to reviewed organizations to improve ISM effectiveness.
- (3) Provide an annual report to the Secretary of Energy concerning the overall status of implementation of ISM at DOE and identifying strengths, best practices, common weaknesses, and opportunities for improvement.

i. Assistant Secretary, Environment, Safety and Health.

- (1) Coordinate DOE line management development of DOE safety policy and guidance necessary for the effective implementation of the DOE ISM program.
- (2) Support the DOE ISM Champions Council in improving the effectiveness of the DOE ISM systems throughout the DOE complex.
- (3) Describe ongoing safety initiatives in the context of DOE-wide ISM implementation and link these initiatives to ISM systems and functions, and performance objectives and measures.

j. Chair, ISM Champions Council.

- (1) Promote continuous learning and improvement of ISM effectiveness throughout the DOE complex.
- (2) Provide guidance and feedback on ISM expectations, methods, and best practices.
- (3) Sponsor and coordinate an annual ISM conference for DOE and contractor personnel to serve as a forum for sharing DOE expectations and guidance, disseminating best practices and lessons learned, developing consensus work products, and promoting the requisite environment for effective implementation of ISM systems.
- (4) Lead the ISM Champions Council to fulfill the functions and responsibilities defined in the ISM Champions Council Charter (see Attachment F).

CHAPTER II. REQUIREMENTS

1. DEVELOPING DOE ISM SYSTEM DESCRIPTIONS.

- a. Secretarial Offices. DOE HQ Secretarial offices shall develop and implement ISM systems. DOE HQ Secretarial offices shall develop and maintain ISM system descriptions that are accurate and up-to-date. Each Secretarial office shall issue an approved Secretarial office ISM system description within three (3) months of the issuance of this manual.
 - (1) ISM system descriptions for DOE Secretarial offices shall be approved by the responsible DOE headquarters Secretarial officer. These system descriptions shall describe the following:
 - (a) how the Secretarial office defines its work activities related to achieving the ISM objective of safe mission accomplishment, as defined in DOE Policy 450.4, Safety Management System Policy.
 - (b) the ISM implementing mechanisms, processes and methods by which the Secretarial office implements the ISM guiding principles, including the four supplemental high-reliability principles, to create an effective environment for ISM implementation, as defined in Attachment 3.
 - (c) the ISM implementing mechanisms, processes and methods by which the Secretarial office implements the ISM core functions.
 - (d) how EMS and QAP are integrated into the ISM system.
 - (e) how the Secretarial office will measure ISM effectiveness, perform annual reviews of ISM implementation, prepare annual ISM declarations, and continuously improve the effectiveness of the ISM system.
 - (f) how the Secretarial office will establish, document, and implement relevant safety performance objectives, measures, and commitments in response to Secretarial direction and budget execution guidance while maintaining the integrity of the system.
 - (g) how the Secretarial office will maintain its ISM system description.
 - (h) the ISM implementing mechanisms and processes that will be used to meet the Secretarial Office responsibilities delineated in this Manual.

- (2) Secretarial office ISM system descriptions shall be consistent with established DOE safety directives, except where exemptions are approved. These ISM system descriptions should follow applicable DOE direction and guidance, including that found in—
 - (a) Attachment 4 of this manual, Guidelines for Developing DOE ISM System Descriptions,
 - (b) DOE G 450.4-1B, *Integrated Safety Management System Guide*, and
 - (c) DOE G 450.1-2, *Implementation Guide for Integrating Environmental Management Systems into Integrated Safety Management Systems*.
 - (3) Each ISM system description will be the controlling management system description for the particular Secretarial office and must be integrated with the corresponding Secretarial office Quality Assurance programs (see existing requirement in DOE Order 414.1C, *Quality Assurance*). Each Secretarial office ISM system must be integrated with the office business processes for work definition and planning, budgeting, authorization, execution, financial management and control, change control, performance measurement, and performance evaluation incorporating lessons learned and continuous improvement. For example, ISM accountabilities and performance should be reflected in employee performance objectives and evaluations. Secretarial office ISM system descriptions may be combined into a single document with the associated Secretarial office's Functions, Responsibilities and Authorities document.
 - (4) ISM system descriptions shall be reviewed at least annually to determine whether updates are needed. If no changes are needed to maintain ISM system description complete, accurate, and up-to-date, then no annual update is necessary. A statement to this effect should be included in the annual ISM declaration. If changes are needed, these will be approved by the Secretarial Officer and provided for final approval by the applicable Central Technical Authority or associated senior DOE official.
 - (5) Secretarial offices shall establish and maintain implementing mechanisms, including processes, policies, protocols, procedures, documentation, and training, to translate ISM system expectations into implementation activities and desired human performance.
- b. Field Offices. DOE field offices (including NNSA site offices and EM project offices) shall develop and implement ISM systems. They shall develop and maintain approved ISM system descriptions that are complete, accurate and up-to-date. Each Field office shall issue an approved Field Office ISM system

description within five (5) months of the issuance of the applicable DOE Secretarial office ISM system description.

- (1) ISM system descriptions for DOE field offices shall be submitted for review and approval by the responsible Secretarial office. These systems descriptions will describe the following:
 - (a) how the field offices define their work activities related to achieving the ISM objective of safe mission accomplishment, as defined in DOE Policy 450.4, *Safety Management System Policy*.
 - (b) the ISM implementing mechanisms, processes and methods by which the field office implements the ISM guiding principles, including the four supplemental high-reliability principles, to create an effective environment for ISM implementation, as defined in Attachment 3.
 - (c) the ISM implementing mechanisms, processes and methods by which the field office implements the five ISM core functions.
 - (d) how EMS and QAP are integrated into the ISM system.
 - (e) how the field office will measure ISM effectiveness, perform annual reviews of ISM implementation, prepare annual ISM declarations, and continuously improve the effectiveness of the ISM system.
 - (f) how the field office will establish, document, and implement relevant safety performance objectives, measures, and commitments in response to Secretarial and budget execution guidance while maintaining the integrity of the system.
 - (g) how the field office will maintain its ISM system description and demonstrate continuous improvement.
 - (h) the ISM implementing mechanisms and processes that will be used to meet the field office responsibilities delineated in this Manual.
- (2) Field office ISM system descriptions shall be consistent with established DOE safety directives, except where exemptions are approved. Field office ISM system descriptions should also be consistent with the associated Secretarial office ISM system description(s). Field office ISM system descriptions should follow applicable DOE direction and guidance, including that found in—
 - (a) Attachment 4 of this manual, Guidelines for Developing DOE ISM System Descriptions,

- (b) DOE G 450.41-B, Integrated Safety Management System Guide, and
 - (c) DOE Guide 450.1-2, Implementation Guide for Integrating Environmental Management Systems into Integrated Safety Management Systems.
 - (3) Each field office's ISM system description will be the controlling management system description for the field office and must be integrated with the Quality Assurance program (see existing requirement in DOE Order 414.1C, *Quality Assurance*). Each field office system must be integrated with the office's business processes for work definition and planning, budgeting, authorization, execution, financial management and control, change control, performance measurement, and performance evaluation. Field office ISM system descriptions may be combined into a single document with the Field office Functions, Responsibilities and Authorities documents.
 - (4) Field office ISM system description will be reviewed at least annually to determine whether updates are needed. If no changes are needed to maintain ISM system description complete, accurate, and up-to-date, then no annual update is necessary. A statement to this effect should be included in the annual ISM summary evaluation. If changes are needed, these will be approved by the field office manager, and provided for final approval by the Secretarial officer.
 - (5) Field offices shall establish and maintain implementing mechanisms, including processes, policies, protocols, procedures, documentation, and training, to effectively translate ISM system expectations into implementation activities and desired human performance.
2. IMPROVING DOE ISM SYSTEM IMPLEMENTATION. Guidelines for improving DOE ISM system implementation are provided in Attachment 5.
- a. ISM Self-Assessments. DOE Secretarial offices and field offices will perform self-assessment reviews of their own work activities supporting effective ISM implementation, consistent with the requirements and guidance of DOE Order 226.1, Implementation of Department of Energy Oversight Policy. Secretarial and field offices will develop corrective action plans to address findings from their self-assessments. Secretarial and field offices will track and close their corrective actions in a timely manner, and perform follow-up effectiveness reviews to determine whether corrective actions have been effective.
 - b. Line Oversight. DOE Secretarial offices and field offices will perform line oversight of ISM implementation at the next lower tier, consistent with the requirements and guidance of DOE Order 226.1, Implementation of Department of Energy Oversight Policy. DOE Secretarial offices will oversee implementation

at the field office level, with sampling at the contractor level to evaluate the effectiveness of the field office. DOE field offices will oversee implementation at the contractor level.

- c. Annual Integrated Reviews. DOE Secretarial offices and field offices will perform an annual integrated review across lower tier elements, if applicable. DOE Secretarial offices will perform an integrated review of the site level annual ISM reviews and declarations by both federal and contractor organizations. DOE field offices will perform an integrated review of contractor annual ISM reviews and declarations, if the office has more than one contractor. These integrated reviews are intended to help identify shared/common weaknesses, best practices, and opportunities for improvement. If a Secretarial or field office has only one entity reporting to it, an integrated review is not possible.
- d. Annual ISM Declarations.
 - (1) DOE Secretarial offices and field offices will annually issue a declaration report of the status of implementation of ISM within that office, including applicable site and contractor operations. The DOE Secretarial offices shall evaluate applicable DOE headquarters and field office activities, and applicable contractor activities; the DOE field offices shall evaluate applicable DOE field office activities and applicable contractor activities. The report shall include:
 - (a) a determination of the overall effectiveness of implementation of ISM,
 - (b) summary strengths, weaknesses, and opportunities for improvement,
 - (c) planned or ongoing actions to enhance ISM effectiveness.
 - (d) a discussion of potential site vulnerabilities to provide an opportunity to develop and enforce risk management options and strategies, including re-scoping activities, re-allocating funds and resources to address the vulnerabilities, or identifying the consequences of proceeding without addressing them.
 - (e) a discussion of any changes in authorization basis including special conditions or exceptions (which require signature approval of the CTA),
 - (f) any directives exemptions per changes in the contract during the year.
 - (2) Annual ISM summary evaluations should provide a comprehensive basis which includes the annual ISM review, lower-level ISM reviews, pertinent

feedback data from a variety of mechanisms, and action plans including corrective or compensatory actions to address weaknesses and opportunities for improvement. For Secretarial offices, the annual ISM summary evaluations should be provided to the next tier up and to the relevant CTA. For field offices, annual ISM declarations should be provided to the responsible Secretarial office for review.

- e. Annual Performance Expectations and Performance Objectives. DOE HQ Secretarial offices will annually prepare and submit safety performance objectives, measures, and commitments, to by the DOE senior official above the Secretarial office (DS will approve EH's, NA-1 will approve NA's, US-ESE will approve those for EM, NE and SC, etc.). DOE field offices will annually prepare and submit safety performance objectives, measures, and commitments, for approval by the HQ Secretarial office.
- f. Full ISM Verifications. At least once every five years, DOE field offices will conduct full ISM verifications of field office ISM activities, including both federal and contractor implementation of ISM.
- g. ISM Champions Council. The DOE ISM Champions Council operates in accordance with its Charter, provided in Attachment 6.

DOE ELEMENTS TO WHICH DOE M 450.4-X IS APPLICABLE

Office of the Secretary
Departmental Representative to the Defense Nuclear Facilities Safety Board
Energy Information Administration
National Nuclear Security Administration
Office of the Chief Financial Officer
Office of the Chief Information Officer
Office of Civilian Radioactive Waste Management
Office of Congressional and Intergovernmental Affairs
Office of Counterintelligence
Office of Economic Impact and Diversity
Office of Electricity Delivery and Energy Reliability
Office of Energy Efficiency and Renewable Energy
Office of Environment, Safety and Health
Office of Environmental Management
Office of Fossil Energy
Office of General Counsel
Office of Hearings and Appeals
Office of Human Capital Management
Office of Intelligence
Office of Legacy Management
Office of Management
Office of Nuclear Energy, Science and Technology
Office of Policy and International Affairs
Office of Public Affairs
Office of Science
Office of Security and Safety Performance Assurance
Office of the Inspector General
Secretary of Energy Advisory Board

CONTRACTOR REQUIREMENTS DOCUMENT
DOE M 450.4-X, *Integrated Safety Management System Manual*

Regardless of the performer of the work, the contractor is responsible for complying with the requirements of this Contractor Requirements Document (CRD) and flowing down CRD requirements to subcontractors at any tier to the extent necessary to ensure contractor compliance.

As directed by the contracting officer, the contractor must meet the following requirements.

1. **RESPONSIBILITIES.**

Contractors are required to implement an effective ISM system for the facilities they operate. The Department also requires integration of EMS and QAP into ISM systems, pursuant to DOE O 450.1, *Environmental Protection Program*, and DOE O 414.1C, *Quality Assurance*.

The contractor must comply with the following requirements to ensure establishment of implementing procedures for the provisions of the Contractor Requirements Document (CRD), compliance with applicable requirements, and effective and efficient performance.

Regardless of the performer of the work, the contractor is responsible for complying with the requirements of this CRD. The contractor is responsible for flowing down the requirements of the CRD to subcontractors at any tier to the extent necessary to ensure the contractor's compliance with the requirements.

2. **REQUIREMENTS.**

- a. Develop and obtain Field office approval of a contractor ISM system description in support of ISM implementation. Maintain cognizance of the associated DOE field office's ISM system description, as provided by the DOE contracting officer, and effectively link and coordinate the contractor's ISM system with the DOE's ISM system.
- b. Support DOE in implementing this Manual through submittals of (1) annual evaluation reviews and annual declaration reports on ISM effectiveness, (2) ISM system description updates, and (3) safety performance objectives, measures, and commitments, in accordance with time schedules established by the DOE contracting officer.
- c. Clearly describe the contractor's ISM maintenance and improvement processes (i.e., annual ISM evaluation reviews, annual declaration reports, ISM system description reviews and updates, and annual updates to the safety performance objectives, measures, and commitments) in the contractor's ISM system description.

- d. Establish and implement a program and process for identifying potential site-wide improvement opportunities relative to ISM and reporting them to the applicable DOE field office ISM Champion. This may be done as part of the annual declaration report.

REQUISITE ENVIRONMENT FOR EFFECTIVE IMPLEMENTATION OF INTEGRATED SAFETY MANAGEMENT (ISM) SYSTEMS

Background

In 1996, the Department defined the Integrated Safety Management (ISM) system as its programmatic framework for accomplishing work safely. Nine years of implementation experience have proven that ISM is a fundamentally sound safety management approach with broad applicability. The ISM concept is also well supported by Department personnel and contractors. The Department remains committed to ISM as its enduring framework for performing work in a safe and environmentally sound manner.

During 2004, the Department recognized and acknowledged the need to revitalize ISM implementation. This need to revitalize or reinvigorate ISM is due to two factors: (1) incompleteness and inconsistencies in implementing ISM principles and functions in programs, sites, offices, and facilities throughout the complex, and (2) a general waning of attention to and use of ISM as it was intended to create and sustain continuous, measurable improvement.

To address inconsistencies in implementation, the Department has targeted three long-recognized weaknesses for renewed attention: (1) work planning and control, (2) feedback and improvement processes, and (3) ISM system description and implementation by DOE federal organizations. To help reinvigorate the use of ISM as the guiding framework for organizational performance improvement, this attachment seeks to clearly describe the context or environment which ISM systems must create and within which ISM systems must function in order to be effective. With this vision, leaders throughout the organization can direct efforts to create the necessary environment for effective ISM implementation and, ultimately, positive culture change that supports safe, environmentally sound and highly productive operations.

Introduction

This attachment seeks to clearly describe and articulate the attributes – expected, observable behaviors – typical of the total environment within which ISM must be implemented to be fully effective. Leaders need to implement appropriate change strategies to make these behaviors recognizable and typical in their work environments. Achieving these desired work behaviors will result in greater productivity as well as improved safety.

Within the ISM hierarchy, it is the ISM principles that describe the environment or context for work activities, in that most ISM principles apply to each and every ISM function. Experience and research with safety cultures and high-reliability organizations (HRO) over the past ten or more years have raised new insights and deeper understanding relevant to the desired work environment for effective safety management. An analysis of this experience and research over the past decade has identified 4 supplemental high-reliability principles that are necessary to focus attention and action in the right areas to create the desired ISM environments. These principles also promote a shift from compliance toward excellence. They emphasize continuous improvement and long-term performance, and are entirely consistent with the original intents of ISM. As the Department moves forward, the desired environment for effective ISM

implementation is described by the seven ISM guiding principles plus four supplemental high-reliability principles.

Guiding Principles for Integrated Safety Management

The Department has established the following principles to guide implementation of Integrated Safety Management (ISM) systems, as defined in DOE Policy 450.4, *Safety Management System Policy*.

LINE MANAGEMENT RESPONSIBILITY FOR SAFETY. *Line management is directly responsible for the protection of the public, the workers, and the environment.*

CLEAR ROLES AND RESPONSIBILITIES. *Clear and unambiguous lines of authority and responsibility for ensuring safety shall be established and maintained at all organizational levels within the Department and its contractors.*

COMPETENCE COMMENSURATE WITH RESPONSIBILITIES. *Personnel shall possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.*

BALANCED PRIORITIES. *Resources shall be effectively allocated to address safety, programmatic, and operational considerations. Protecting the public, the workers, and the environment shall be a priority whenever activities are planned and performed.*

IDENTIFICATION OF SAFETY STANDARDS AND REQUIREMENTS. *Before work is performed, the associated hazards shall be evaluated and an agreed-upon set of safety standards and requirements shall be established which, if properly implemented, will provide adequate assurance that the public, the workers, and the environment are protected from adverse consequences.*

HAZARD CONTROLS TAILORED TO WORK BEING PERFORMED. *Administrative and engineering controls to prevent and mitigate hazards shall be tailored to the work being performed and associated hazards.*

OPERATIONS AUTHORIZATION. *The conditions and requirements to be satisfied for operations to be initiated and conducted shall be clearly established and agreed upon.*

NOTE: The ISM core functions describe the specific work activities that must be accomplished, and these are not explicitly addressed by this attachment:

- (1) define the work,
- (2) identify and analyze the hazards,
- (3) identify and implement the controls,
- (4) perform work safely within controls, and

- (5) feedback and improvement.

It is vitally important that each organizational element effectively implement these five core functions, beginning with accurately and completely defining its own work, to the extent necessary to support the safe conduct of operational work activities. The core functions are described in detail in DOE G 450.4-1B, *Integrated Safety Management System Guide*, and have received considerable attention. This attachment focuses on the ISM principles because these have received less attention than needed to achieve the requisite environment for effective ISM implementation.

1. **Line Management Responsibility for Safety.** *Line management is directly responsible for the protection of the public, the workers, and the environment.*

Attributes

- Line management (from the Secretary of Energy to the DOE cognizant Secretarial Officer to the DOE Field Office Manager to the Contractor Senior Manager to the front-line worker) understands and accepts their safety responsibilities inherent in mission accomplishment. Line management does not depend on supporting organizations to build safety into line management work activities.
- Line management has a clear understanding of its work activities and its performance objectives, and how it will conduct its work activities safely and accomplish its performance objectives.
- Leaders demonstrate commitment to safety. Executive and senior managers are the leading advocates of safety and demonstrate their commitment both in word and action.
- Organization leaders periodically take steps to reinforce safety, including personal visits and walkthroughs to verify that their expectations are being met.
- Organization leaders practice visible leadership in the field by placing “eyes on the problem,” coaching, mentoring, and reinforcing standards and positive behaviors. Deviations from expectations are corrected promptly.
- Line management maintains a strong focus on the safe conduct of work activities.
- Line management maintains awareness of key performance indicators related to safe work accomplishment, watches carefully for adverse trends or indications, and takes prompt action to understand adverse trends and anomalies.
- Leaders throughout the organization set an example for safety through their direct involvement in continuous learning by themselves and their followers on topics related to technical understanding and safety improvement.
- Managers and supervisors are skilled in responding to employee questions in an open, honest manner. They encourage reporting of safety issues and errors. They do not discipline employees for the reporting of errors. They encourage a vigorous questioning attitude toward safety, and constructive dialogues and discussions on safety matters.
- Credibility and trust are present and continuously nurtured. Leaders reinforce perishable values of trust, credibility, and attentiveness.
- The organization is just. The system of rewards and sanctions is aligned with strong safety policies and reinforces the desired behaviors and outcomes.

2. **Clear Roles and Responsibilities.** *Clear and unambiguous lines of authority and responsibility for ensuring safety shall be established and maintained at all organizational levels within the Department and its contractors.*

Attributes

- Responsibility and authority for safety are well defined and clearly understood as an integral part of performing work.
- Organizational safety responsibilities are sufficiently comprehensive to address the work activities and hazards involved.
- The line of authority and responsibility for safety is defined from the Secretary of Energy to the individual contributor. Each of these positions has clearly defined roles, responsibilities, and authorities, designated in writing and understood by the incumbent.
- Organizational Functions, Responsibilities, and Authorities documents are maintained current and accurate.
- Reporting relationships, positional authority, staffing levels and experience, processes and infrastructure, and financial resources are commensurate with and support safety responsibilities.
- All personnel understand the importance of adherence to safety standards.
- Line management oversight is provided to reinforce expectations and ensure that key safety responsibilities and expectations are being met.
- Personnel are held accountable at all levels of the organization for shortfalls in meeting standards and expectations related to fulfilling safety responsibilities. Accountability is demonstrated both by recognition of excellent safety performers as well as identification of less-than-adequate performers. In holding people accountable, managers consider individual intentions and the organizational factors that may have contributed.

3. **Competence Commensurate with Responsibilities.** *Personnel shall possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.*

Attributes

- People and their professional capabilities, experiences, and values are regarded as the organization's most valuable assets. The organization places a high priority on recruiting, selection, and retention of an excellent technical staff.
- The organization maintains a highly knowledgeable workforce to support a broad spectrum of operational and technical decisions. Technical and safety expertise is embedded in the organization. Outside expertise is employed when necessary.
- Individuals have in-depth understanding of safety and technical aspects of their jobs. Technical qualification standards are defined and personnel are trained accordingly. Technical support personnel have expert-level technical understanding. Senior managers have strong technical backgrounds in their area of expertise.
- Assignments and delegations of safety responsibilities are made to individuals with the necessary technical experience and expertise. In rare cases, if this is not possible, corrective and compensatory actions are taken.
- The organization values and practices continuous learning, and requires employees to participate in recurrent and relevant training and educational experiences to improve knowledge, skills, and abilities. Professional and technical growth is formally supported and tracked to build organizational capability.
- Old models and practices are updated and refreshed based on new information and new understanding.
- Training effectively upholds management's standards and expectations. Beyond teaching knowledge and skills, trainers are adept at instilling requisite safety values and beliefs.
- Training to broaden individual capabilities and to support organizational learning is available and encouraged – to appreciate the potential for unexpected conditions; to recognize and respond to a variety of problems and anomalies; to understand complex technologies and capabilities to respond to complex events; to develop flexibility at applying existing knowledge and skills in new situations; to improve communications; to learn from significant industry and DOE events.
- Leaders set an example for safety through their personal commitment to continuous learning and by their direct involvement in high-quality training that consistently reinforces expected worker behaviors.
- Informal opinion leaders in the organization are encouraged to model safe behavior and influence peers to meet high standards.

4. **Balanced Priorities.** *Resources shall be effectively allocated to address safety, programmatic, and operational considerations. Protecting the public, the workers, and the environment shall be a priority whenever activities are planned and performed.*

Attributes

- Organization leaders frequently and consistently communicate the safety message, both as an integral part of the mission and as a stand-alone theme.
- Leaders recognize that aggressive mission and production goals can appear to send mixed signals on the importance of safety. Managers are sensitive to detect and avoid these misunderstandings, or to deal with them effectively if they arise.
- The organization demonstrates a strong sense of mission and operational goals, including a commitment to highly reliable operations, both in production and safety. Safety and productivity are both highly valued.
- Safety and productivity concerns both receive balanced consideration in funding allocations and schedule decisions. If funding is not adequate to ensure safety, operations are discontinued.
- Staffing levels and capabilities are consistent with expectation of maintaining safe and reliable operations.
- The organizational staffing provides sufficient depth and redundancy to ensure that all important safety functions are adequately performed.
- The organization is able to build and sustain a flexible, robust technical staff and staffing capacity. Pockets of resilience are established through redundant resources. The organization develops sufficient resources to rapidly cope and respond to unexpected changes.
- Key technical officials are assigned for long terms of service to provide institutional continuity and constancy regarding safety requirements and expectations. Organizational knowledge is valued and efforts are made to preserve it when key players move on.
- Systems of checks and balances are in place and effective at all levels of the organization to make sure that safety considerations are adequately weighed and prioritized.
- Safety and quality assurance positions have adequate organizational influence.
- Adequate resources are made available for safety upgrades and repairs to aging infrastructure. Modern infrastructure and new facility construction are pursued to improve safety and performance over the long-term.

5. **Identification of Safety Standards and Requirements.** *Before work is performed, the associated hazards shall be evaluated and an agreed-upon set of safety standards and requirements shall be established which, if properly implemented, will provide adequate assurance that the public, the workers, and the environment are protected from adverse consequences.*

Attributes

- Facilities are designed, constructed, operated, maintained, and decommissioned using applicable consensus industry codes and standards, where available and applicable, to protect workers, the public, and the environment.
- Applicable requirements from laws, statutes, rules and regulations are identified and captured so that compliance can be planned, expected, demonstrated, and verified.
- Clear, concise technical safety directives that are centrally developed, where necessary, and are based on sound engineering judgment and data. DOE directives and technical standards are actively maintained up to date and accurate.
- A clearly-defined set of safety requirements and standards are invoked in management contracts, or similar agreements. An accepted process is used for identification of the appropriate set of requirements and standards. This set of requirements is comprehensive and includes stringent quality assurance, safety, and radiological and environmental protection requirements.
- Implementing plans, procedures and protocols are in place to effectively translate requirements into action by the implementing organization.
- Technical and operational safety requirements clearly control the safe operating envelope. The safety envelope is clearly specified and communicated to individuals performing operational tasks.
- Exemptions from applicable technical requirements are rare, specific, short-term, provide equivalent safety, have a compelling technical basis, and are approved by a central technical authority.
- Compliance with applicable safety and technical requirements is expected and verified.
- Willful violations of requirements are rare, and personnel and organizations are held strictly accountable. Unintended violations of requirements are promptly reported, and personnel and organizations are given credit for self-identification and reporting of errors.
- The organization actively seeks to continuously improve safety standards and requirements through identification and sharing of effective practices, lessons learned, and applicable safety research. The organization is committed to continuously rising standards of excellence.

6. **Hazard Controls Tailored to Work Being Performed.** *Administrative and engineering controls to prevent and mitigate hazards shall be tailored to the work being performed and associated hazards.*

Attributes

- Work hazards are identified and controlled to prevent or mitigate accidents, with particular attention to low probability, high consequence events with unacceptable consequences. Workers understand hazards and controls before beginning work activities.
- The selection of hazard controls considers the type of hazard, the magnitude of the hazard, the type of work being performed, and the life-cycle of the facility.
- Safety analyses identifying work hazards are comprehensive and based on sound engineering judgment and data.
- Defense in depth is designed into highly-hazardous operations and activities, and include independent, redundant, and diverse safety systems, which are not overly complex. Defense in depth controls include engineering controls, administrative processes, and personnel staffing and capabilities.
- Emphasis is placed on designing the work and/or controls to reduce or eliminate the hazards and to prevent accidents and unplanned releases and exposures.
- A hierarchy of defense in depth is recognized and applied. Inherently safe designs are preferred over ones requiring engineering controls. Engineering safeguards are preferred over administrative controls. Administrative controls are preferred over personnel protective equipment. Prevention is emphasized in design and operations to minimize the use of, and thereby possible exposure to, toxic or hazardous substances.
- Equipment is consistently maintained so that it meets design requirements.
- Safety margins are rigorously maintained. Design and operating margins are carefully guarded and changed only with great thought and care. Special attention is placed on maintaining defense-in-depth.
- Organizations implement hazard controls in a consistent and reliable manner. Safety is embedded in processes and procedures through a functioning formal integrated safety management system. Facility activities are governed by comprehensive, efficient, high-quality processes and procedures.
- Hazard controls are designed with an understanding of the potential for human error. Error-likely situations are identified, eliminated, or mitigated. Existence of known error-likely situations is communicated to workers prior to commencing work. Work is planned with consideration of error-likely situations.

7. **Operations Authorization.** *The conditions and requirements to be satisfied for operations to be initiated and conducted shall be clearly established and agreed upon.*

Attributes

- Formal facility authorization agreements are in place and maintained between owner and operator.
- Readiness is verified before hazardous operations commence.
- Facility operations personnel maintain awareness of all facility activities to ensure compliance with the established safety envelope.
- Operations authorization is defined at the job and task level. The work authorization process verifies that adequate preparations have been completed so that work can be performed safely. These preparations include verifying that work methods and requirements are understood; verifying that work conditions will be as expected and not introduce unexpected hazards; and verifying that necessary controls are implemented.
- The extent of documentation and level of authority for agreement is based on the complexity and hazards associated with the work, and are clearly documented in the controlling ISM system description.

Supplemental High-Reliability Principles for Effective Safety Management System Implementation

Based on experience and learning over the past ten years since the inception of Integrated Safety Management, the Department has established the following four supplemental high-reliability principles to be used, along with the existing ISM guiding principles, to help develop the appropriate context or environment for effective implementation of Integrated Safety Management (ISM) systems within the Department of Energy and at its sites and facilities in the future:

- **HIGHLY-RELIABLE OPERATIONAL PERFORMANCE.** *Organizations achieve sustained, high levels of operational performance, encompassing all DOE and contractor activities to meet mission, safety, productivity, quality, environmental, and other objectives. High-reliability is achieved through a focus on operations, quality decision-making, open communications, deference to expertise, and systematic approaches to eliminate or mitigate error-likely situations.*
- **INDIVIDUAL ATTITUDE AND RESPONSIBILITY FOR SAFETY.** *Every individual accepts responsibility for safe mission performance. Individuals demonstrate a questioning attitude by challenging assumptions, investigating anomalies, and considering potential adverse consequences of planned actions. All employees are mindful of work conditions that may impact safety, and assist each other in preventing unsafe acts or behaviors.*
- **OVERSIGHT FOR PERFORMANCE ASSURANCE.** *Competent, robust, periodic and independent oversight is an essential source of feedback that verifies expectations are being met and identifies opportunities for improvement. Performance assurance activities verify whether standards and requirements are being met. Performance assurance through conscious, directed, independent reviews at all levels brings fresh insights and observations to be considered for safety and performance improvement.*
- **ORGANIZATIONAL LEARNING FOR PERFORMANCE IMPROVEMENT.** *The organization demonstrates excellence in performance monitoring, problem analysis, solution planning, and solution implementation. The organization encourages openness and trust, and cultivates a continuous learning environment.*

1. **Highly-Reliable Operational Performance.** *Organizations achieve sustained, high levels of operational performance, encompassing all DOE and contractor activities to meet mission, safety, productivity, quality, environmental, and other objectives. High-reliability is achieved through a focus on operations, quality decision-making, open communications, deference to expertise, and systematic approaches to eliminate or mitigate error-likely situations.*

Attributes

- Leaders are in close contact with the front-line; leaders pay attention to real-time operational information. Maintaining operational awareness is a priority. Leaders identify critical performance elements and monitor these closely.
- Operational anomalies, even small ones, get prompt attention and evaluation – this allows early detection of problems so necessary action is taken before problems grow.
- People are systematic and rigorous in making decisions that support safe, reliable operations. Workers are expected and authorized to take conservative actions when faced with unexpected or uncertain conditions. Leaders support and reinforce conservative decisions.
- Candid dialogue and debate and a healthy skepticism are encouraged when safety issues are being evaluated. Differing professional opinions are welcomed and respected. Robust discussion and constructive conflict are recognized as a natural result of diversity of expertise and experience.
- Leaders regularly and promptly communicate important operational decisions, their basis, expected outcomes, potential problems, and planned contingencies.
- Organizations know the expertise of their personnel. Leadership and decision-making are delegated to qualified individuals with relevant expertise during operational upset conditions. People closest to the operational upset are empowered to make important decisions, and are held accountable justly.
- Operations personnel are held to high standards of both technical understanding and detailed task-oriented performance. Operations personnel provide reliable and consistent responses to expected occurrences. Flexible responses to unexpected occurrences are based on continuous preparation and training. Formality and discipline in operations is valued.
- Organizational systems and processes are designed to provide layers of defenses, recognizing that people are fallible. Error prevention and mitigation defenses are used to preclude errors from propagating. Error-likely situations are sought out and corrected, and recurrent errors are carefully examined as indicators of latent organizational weaknesses. Leaders aggressively and promptly correct latent organizational weaknesses and measure the effectiveness of actions taken to close the gaps.

2. **Individual Attitude and Responsibility for Safety.** *Every individual accepts responsibility for safe mission performance. Individuals demonstrate a questioning attitude by challenging assumptions, investigating anomalies, and considering potential adverse consequences of planned actions. All employees are mindful of work conditions that may impact safety, and assist each other in preventing unsafe acts or behaviors.*

Attributes:

- Individuals understand and demonstrate responsibility for safety. Safety and its ownership are apparent in everyone's actions and deeds. Workers are involved in job planning. Workers follow approved procedures. Workers at any level can stop unsafe work or work during unexpected conditions.
- Workers are actively involved in identification, planning and improvement of work and work practices.
- People promptly report errors and incidents. People feel safe from reprisal in reporting errors and incidents; people offer suggestions for improvement and innovative solutions.
- People are mindful of the possibility and potential impact of process and equipment failures; people are sensitive to the potential of faulty assumptions and errors, and demonstrate constructive skepticism. People appreciate that mindfulness requires effort.
- People recognize that errors and imperfections are likely to happen. They recognize the limits of foresight and anticipation, and watch for things that have not been seen before. People appreciate that error-likely situations are predictable, manageable, and preventable, and seek to identify and eliminate latent conditions that give rise to human performance errors.
- Individuals cultivate a constructive, questioning attitude and healthy skepticism when it comes to safety. Team members support one another through both awareness of each other's actions and constructive feedback when necessary.
- Individuals are aware of and counteract human tendencies to simplify assumptions, expectations, and analysis. Diversity of thought and opposing views are welcomed and considered. Intellectual curiosity is encouraged.
- Individuals are intolerant of conditions or behaviors that have the potential to reduce operating or design margins. Anomalies are thoroughly investigated, promptly mitigated, and periodically analyzed in the aggregate. The bias is set on proving work activities are safe before proceeding, rather than proving them unsafe before halting. Personnel do not proceed when safety is uncertain.

- Individuals question deviances, and avoid institutional complacency or arrogance based on past successes. Individuals are attentive to indications of organizational arrogance, overconfidence, narrowed perception, or false optimism.
- Individuals outside your organization (including subcontractors, temporary employees, visiting researchers, vendor representatives, etc.) understand their safety responsibilities.

3. **Oversight for Performance Assurance.** *Competent, robust, periodic and independent oversight is an essential source of feedback that verifies expectations are being met and identifies opportunities for improvement. Performance assurance activities verify whether standards and requirements are being met. Performance assurance through conscious, directed, independent reviews at all levels brings fresh insights and observations to be considered for safety and performance improvement.*

Attributes:

- Performance assurance consists of robust, frequent, and independent oversight, conducted at all levels of the organization. Performance assurance includes independent evaluation of performance indicators and trend analysis.
- Performance assurance programs are guided by plans that ensure a base level of relevant areas are reviewed. Assessments are performed to established requirements (or Criteria and Review Approach Documents).
- Efficient redundancy in monitoring is valued; higher levels of redundancy are recognized as necessary for higher risk activities.
- Performance Assurance includes a diversity of independent “fresh looks” to ensure completeness and to avoid complacency. A mix of internal and external oversight reviews reflects an integrated and balanced approach. This balance is periodically reviewed and adjusted as needed.
- The insights and fresh perspectives provided by performance assurance personnel are valued. Organizational feedback is actively sought to make performance assurance activities more value-added.
- Complete, accurate, and forthright information is provided to performance assurance organizations.
- Findings from performance assurance activities are effectively integrated into the performance improvement processes, such that they receive adequate and timely attention. Linkages with other performance monitoring inputs are examined, high-quality causal analyses are conducted, as needed, and corrective actions are tracked to closure with effectiveness verified to prevent future occurrences.
- Leaders throughout the organization set an example for safety through their direct involvement in oversight activities and associated performance improvement.
- Senior executives are periodically briefed on results of oversight group activities to gain insight into organizational performance and to direct needed corrective actions.
- Periodic ISM assessments are conducted and used as a basis for ISM program adjustments and implementation improvements.

4. **Organizational Learning for Performance Improvement.** *The organization demonstrates excellence in performance monitoring, problem analysis, solution planning, and solution implementation. The organization encourages openness and trust, and cultivates a continuous learning environment.*

Attributes:

- The organization actively and systematically monitors performance through multiple means, including leader walk-arounds, issue reporting, performance indicators, trend analysis, benchmarking, industry experience reviews, self-assessments, and performance assessments. Feedback from various means is integrated to create a full understanding.
- Processes are established to identify and resolve latent organizational weaknesses that can aggravate relatively minor events if not corrected. Linkages among problems and organizational issues are examined and communicated.
- Open communications and teamwork are the norm. People are comfortable raising and discussing questions or concerns. No news is bad news. All information is valued, because it shows that the organization is effectively self-monitoring.
- A high level of trust is established in the organization. Reporting of individual errors is encouraged and valued. A variety of methods are available for personnel to raise safety issues, without fear of retribution.
- Organization members convene to swiftly uncover lessons and learn from mistakes. Frequent incident reviews are conducted promptly after an incident to ensure data quality to identify improvement opportunities.
- Operating experience is highly valued, and the capacity to learn from experience is well developed. The organization regularly examines and learns from operating experiences, both internal and in related industries.
- Expertise in causal analysis is applied effectively to examine events and improve safety focus. High-quality causal analysis is the norm. Causal analysis is performed on a graded approach for both major and minor incidents. Any failure, no matter how small, is viewed as a window into the system that can spur learning.
- Performance improvement processes encourage workers to offer innovative ideas to improve performance and to solve problems.
- Leaders are actively involved in all phases of performance monitoring, problem analysis, solution planning, and solution implementation to resolve safety issues.
- Vigorous corrective and improvement action programs are in place and effective. Rapid response to problems and closeout of issues ensures that small issues do not become large ones. Managers are actively involved to balance priorities to achieve timely resolutions.

Implementation

Initially, DOE offices will be required to prepare ISM system descriptions that address how these principles will be implemented to create the desired behaviors for effective ISM implementation. DOE has a very important role in establishing the correct environment for ISM implementation and it is appropriate for DOE actions to lead this effort. It is expected that some DOE contractors seeking excellence will find it beneficial to adopt all or part of this approach, and begin gaining experience and improved performance. Ultimately, DOE directives will be revised to capture the experience, lessons learned, successful implementation methods, and good practices related to implementation. When the DOE directives and ISM DEAR clause are revised, the contractors will be required to address any changes or additions to the ISM program principles.

Conclusion

Thorough and consistent implementation of the principles in this document will provide the necessary environment for DOE organizations to succeed and thrive. These principles provide the vision for DOE to achieve the essential attributes of a high-performing organization, and further improve the Department's safety record and productivity record. These principles capture the elements needed for DOE to move beyond a compliance-based approach to a performance-based approach, consistent with more mature high-reliability organizations.

For example, the International Atomic Energy Agency (IAEA) developed a capability maturity model that illustrates the stages that an organization goes through in achieving a mature safety culture. These stages are:

Stage I. The organization sees safety as an external requirement and not as an aspect of conduct that will help the organization to succeed. The external requirements are those of national governments, regional authorities, or regulatory bodies. There is little awareness of behavioral and attitudinal aspects of safety performance, and no willingness to consider such issues. Safety is seen very much as a technical issue. Mere compliance with rules and regulations is considered adequate.

Stage II. An organization at Stage II has a management which perceives safety performance as important even in the absence of regulatory pressure. Although there is growing awareness of behavioral issues, this aspect is largely missing from safety management methods which comprise technical and procedural solutions. Safety performance is dealt with, along with other aspects of the business, in terms of targets or goals. The organization begins to look at the reasons why safety performance reaches a plateau and is willing to seek the advice of other organizations.

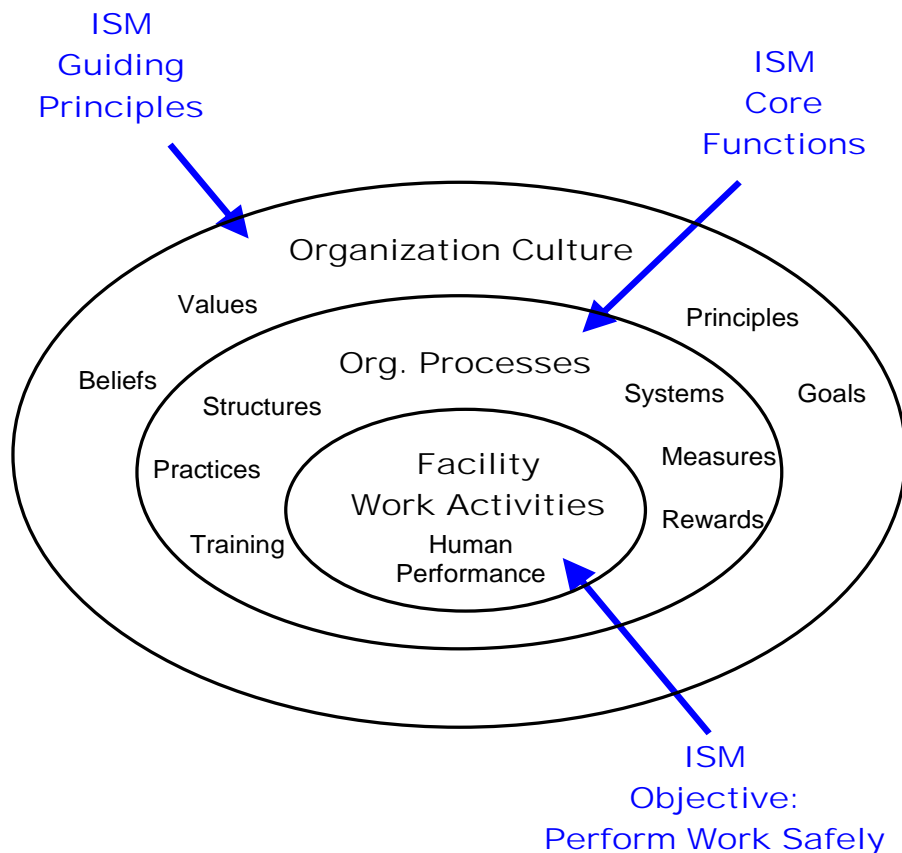
Stage III. An organization at Stage III has adopted the idea of continuous improvement and applied the concept to safety performance. There is a strong emphasis on communications, training, management style, and improving efficiency and effectiveness. Everyone in the organization can contribute. Some behaviors are seen within the organization which enables improvements to take place and, on the other hand, there are behaviors which act as a barrier to further improvement. Consequently, people also

understand the impact of behavioral issues on safety. The level of awareness of behavioral and attitudinal issues is high, and measures are being taken to improve behavior. Progress is made one step at a time and never stops. The organization asks how it might help other companies.

The principles described herein can take the Department to IAEA Stage III performance, a fully developed safety culture.

Relationship between ISM Principles, Functions, Operational Work, and Performance Results.

The figure below depicts various levels within the organizational culture. The outer level represents the environment within which the work must taken place. The outer level is most influenced by the ISM Principles. The next level is the process level, where management systems are defined to direct behaviors. This level is most influenced by the ISM Functions. The inner-most level is the activity-level work itself, where operational work is performed. This work is the direct interaction between people and physical facility, and is mostly performed by DOE contractors (except at GoGos). This is the level at which organizations can measure performance and determine whether the ISM program objectives have been realized. Showing work at the inner-most level does not mean that work is not required at the other levels; indeed, work activities are required at the other levels to develop work processes and work environments that are highly reliable and error tolerant.



GUIDELINES FOR DEVELOPING DOE ISM SYSTEM DESCRIPTIONS

1. INTRODUCTION AND GENERAL APPROACH TO CHANGE.

The Department views the ISM System Description as the safety road-map for the organization. The Description defines the integral role of safety in the Department's business approach, processes, and financial management control system.

The objective of developing and maintaining ISM system descriptions is much more than a simple paper or documentation exercise, where DOE organizations identify activities and processes being accomplished to fulfill ISM principles and functions. Rather, it is expected to spur real and ongoing dialogue and exploration of areas needing attention for ISM implementation and improvement. Senior leadership commitment to ISM must be visible and clear at all levels. This commitment is borne out of an understanding of intended safety management values and processes, and personal engagement in developing and sustaining the ISM system. The ISM system is documented for stability and continuity, for communicating to existing organization members and others the office's approach to safety management, and for new members to be inculcated.

Development of ISM Manuals and implementation of identified improvements and commitments is expected to have a significant impact on DOE attitudes and behaviors related to safety. As such, these desired changes should be managed consciously and vigorously. The following change management steps are valid and relevant to this effort:

- Develop a Sense of Urgency
- Establish the Guiding Coalition
- Develop the Vision and Strategy
- Communicate the Change Vision
- Empower Employees for Broad-Based Action
- Generate Short-Term Wins
- Consolidate Gains and Produce More Change
- Anchor New Approaches in the Culture (Institutionalize the New Approaches)

2. DEVELOPING THE ISM SYSTEM DESCRIPTION. The format of the ISM system description is left up to the developing organizations, but the documents must address the elements defined in Section II, Requirements, of this Manual. The following approach is recommended:

- a. Develop your organization's statement on what ISM is and what it is to achieve (for example, zero accidents, establishment of performance goals, foundation for the organization's safety culture, etc.):
 - Why safety is the top priority.
 - What ISM is.
 - The outcomes and results to be achieved through ISM.
 - How DOE ISM is systematically used for achieving performance results.
- b. Establish leadership's safety values, expectations and commitments (corporate culture):
 - DOE safety values are based on ISM Principles and Functions.
 - Management commitments to the organization for a safe work environment.
 - Management commitments to protect the environment, and comply with regulatory requirements.
 - Management commitment to protect the health of workers and the public.
 - The safety expectations for each Federal employee.
 - Recognizing the role, relevance and value of HRO principles and methods as a part of the ISM approach.
 - Recognizing the role, relevance and value of HPI principles and methods as a part of the ISM approach.
- c. Define the DOE management processes and systems that will be used to achieve the ISM Principles and Functions. Describe the management systems needed to execute each ISM Principle (including the four supplemental HRO principles) and each ISM Function:
 - Describe the Federal work activities relevant to each ISM principle and function to ensure that it is effectively executed.
 - Define the management systems and processes needed for each Principle and Function. Management systems are the primary implementing mechanisms for ensuring implementation of ISM.
 - Align the management systems to each ISM Principle and Function, and with each other.

- Integrate ISM with other management systems, such as Quality Assurance Programs, Environment Management Systems, and Integrated Safeguards and Security management systems. Describe linkages, interfaces, and coordinating mechanisms.
 - Examine the condition of the management systems (gap analysis) to determine if they effectively execute ISM Principles. Identify gaps. Identify strengths and weaknesses.
 - Identify the management systems that need to be established or strengthened. Identify specific actions (with end-state deliverables, responsible managers, and completion schedules) to establish and improve needed management processes and systems.
 - Describe the communications and training plan that ensures that all members of your organization will be familiar with the organization's ISM system and will be familiar with their safety roles and responsibilities.
 - Identify those outside your organization that contribute work activities to fulfilling your organization's ISM responsibilities. Establish mechanisms to ensure those identified are familiar with your ISM system and perform their work activities consistent with your ISM system.
- d. Identify other DOE actions/initiatives taken to improve safety (supplemental to the management systems) and promote a positive safety culture. These can most likely be associated with implementation of specific ISM functions and principles. Examples of other DOE initiatives:
- Monthly all-hands meetings with a safety focus.
 - Developing a safety brochure explaining the Manager's safety values.
 - Establishing DOE teams to develop improvement initiatives.
 - Safety objectives and measures developed in support of DOE Policy 450.7 *Environment, Safety and Health (ESH) Goals*, 8/2/2004.
- e. Define the expected attributes and results of the ISM. Describe how continuous improvement will be demonstrated. Determine how your organization will measure progress (performance measures):
- Quantify specific DOE safety objectives for tracking.
 - Develop measures for each individual ISM Principle and Function.
 - Relate the measures directly to DOE work activities

- f. Determine how you will maintain and improve your ISM system:
 - ISM System Description changes
 - ISM System Effectiveness reviews
 - ISM Safety Performance Objectives, Measures, and Commitments Updates
 - ISM Summary Evaluations
 - g. Confirm that implementation mechanisms (processes, policies, protocols, procedures, training, etc.) are adequate to implement and integrate the ISM objective, principles, and functions. Prepare cross-walk to communicate implementation mechanisms and demonstrate coverage of ISM objective, principles, and functions.
 - h. Describe how the Principles, Management Systems, other Implementing Mechanisms, and Performance Measures integrate to achieve ISM attributes and objectives.
 - i. Prepare summary of actions to implement the ISM system description and/or its update, and to address known weaknesses and opportunities for improvement. For example, identify schedule and responsibility for revision to the office Functions, Responsibilities and Assignments manual, if necessary.
3. SAMPLE TABLE OF CONTENTS FOR ISM SYSTEM DESCRIPTION. The following is a sample Table of Contents.

Executive Summary

Definitions and Acronyms

1.0 Purpose and Objectives

2.0 Overview of the ISM System

3.0 Management Expectations

4.0 Roles and Responsibilities

4.1 Federal Responsibilities

4.2 Contractor Expectations

5.0 Implementation of ISM

5.1 Implementation of ISM Guiding Principles (including Four Supplemental High-Reliability Principles)

- 5.2 Implementation of the Five Core Functions
- 5.3 Integration with QA, EMS, and ISSM
- 5.4 Communications and Training Plan
- 6.0 Other Safety-Related Initiatives
- 7.0 Annual ISM Maintenance and Improvement Processes
 - 7.1 ISM System Description Maintenance and Improvement
 - 7.2 ISM Annual Oversight, Effectiveness Reviews and Self-Assessments
 - 7.3 ISM Annual Safety Performance Objectives, Measures and Commitments Process
 - 7.4 ISM Annual Summary Evaluation Process
- 8.0 Conclusions

Attachment 2: Cross-Walk to Implementing Mechanisms

Attachment 3: Annual Update to Safety Performance Objectives, Measures, and Commitments

Attachment 4: Summary of Actions

4. INTEGRATION OF MANAGEMENT SYSTEMS. The Department has established requirements for multiple management systems, including:
- Integrated Safety Management System
 - Environmental Management System
 - Quality Assurance
 - Project Management System
 - Financial Management System
 - Integrated Safeguards and Security Management System

The Environmental Management System is expected to be part of the ISM system. The Quality Assurance program is expected to be integrated with the ISM system. It is desirable that these three programs in particular be well integrated, under an ISM umbrella. Secretarial offices should provide further direction and guidance to field offices on how to most effectively integrate management systems.

These multiple systems should be coordinated, linked, and integrated to the maximum extent possible. If one integrated system description can be achieved, which effectively communicates to its multiple intended audiences, this is desirable. If one integrated system description can not be achieved, then, at the least, the interfaces of the various systems need to be identified, acknowledged and articulated. The feasibility of successfully integrating these various systems into one manual has not been fully determined. It is important that the main purpose and functions of each system is not lost or subsumed.

5. SAMPLE DOE WORK ACTIVITIES.

The Department's role is different from the contractor role, but it is important for assuring safety, and it needs to be clearly articulated in the ISM system description. DOE has work activities related to every ISM principle and function.

(Except for Government-Owned, Government-Operated (GO-GO) facilities) DOE federal organizations do not perform "operational work activities" involving physical, hands-on work, such as turning knobs in a production line or a control room, processing or transferring environmental waste, performing maintenance on a pump or valve, or disassembling weapons or re-packaging pits. "Operational work activities" are the main focus of ISM in that physical work activities are the main source of human errors that can lead to facility occurrences and organizational accidents. Some occurrences are initiated by equipment failures, such as tank failures; in these cases, an "operational work activity" usually exists to monitor performance of equipment that controls hazards. "Operational work activities" are concentrated within the ISM core function #4, "perform work safely within controls." They are also concentrated at the activity-level, rather than the organizational- or enterprise-level.

DOE and contractors perform a myriad of non-operational work activities that are essential for assuring safety during the conduct of "operational work activities." These non-operational work activities include defining work scopes, allocating resources, designing safety controls, developing safety analyses, conducting assessments, developing corrective action plans, and integrating feedback sources to identify opportunities for improvement. Non-operational work activities encompass the vast majority of DOE and contractor work related to effectively implementing the ISM principles to create the requisite environment and culture that supports effective ISM implementation. Non-operational work activities encompass the vast majority of DOE and contractor work related to effectively implementing four of the five core ISM functions, all but the fourth one. Non-operational work activities encompass the vast majority of DOE and contractor work at the organizational- and enterprise-level. When planning, performing, and reviewing the effectiveness of non-operational work activities, the ultimate result is the impact of these work activities on safety performance of associated operational work activities. The associated operational work activities should remain the focus of non-operational work activities, not the physical work involved in the non-operational work activities, such as turning on the computer, performing a calculation, participating in a meeting, or printing a document.

Examples of inherently Federal non-operational work activities that are required for the overall Department-wide ISM system to be effective, and to integrate safety effectively into operational work being accomplishment in the Department's facilities, include:

- Providing clear and visible DOE leadership vision on ISM system,
- Establishing a positive DOE environment for effective ISM system implementation,
- Establishing missions,
- Translating the missions into meaningful scopes of work,
- Establishing annual budgets, including making decisions on mission-safety trade-offs,
- Prioritizing major projects and work-scopes, and allocating resources to ensure that work and safety are integrated, and sufficient resources are available to conduct work safely,
- Evaluating resource short-falls and identifying safety problems to ensure adequate resources are applied to resolve safety problems and secure safety improvements,
- Developing DOE safety rules, directives and standards,
- Establishing DOE contracts, including delineation of safety requirements,
- Approving exemptions to safety requirements,
- Assigning DOE safety management roles and responsibilities,
- Recruiting highly qualified, technical Federal personnel,
- Approving safety analysis reports and technical safety requirements,
- Determining when authorization agreements are needed and approving authorization agreements,
- Maintaining Federal awareness of contractor work activities, including implementation of hazard controls,
- Performing operational readiness reviews,
- Maintaining operational awareness,
- Establishing and implementing feedback and improvements programs and processes to facilitate a culture that promotes ongoing examination and learning,
- Monitoring various sources of feedback information,

- Developing, and implementing corrective actions and improvement actions,
- Monitoring performance of corrective action and improvement action sub-systems,
- Managing the DOE operational experience program,
- Planning and performing self-assessments of assigned federal work activities,
- Planning and performing oversight of contractor work activities,
- Providing clear expectations for the conduct of DOE line management oversight reviews and self-assessment activities, including direction on criteria review and approach documents (CRADs) to use,
- Planning and performing DOE line management oversight of DOE activities, as appropriate,
- Performing independent oversight of DOE and contractor activities,
- Identifying and acting on ISM weaknesses and opportunities for improvement,
- Reviewing annual ISM declarations by contractors,
- Performing annual ISM effectiveness reviews,
- Providing direction, establishing schedules, and approving annual performance objectives, performance measures, and commitments for contractors.
- Integrating management systems and process for safety, quality, environmental protection, and security
- Determining when full ISM verification reviews are necessary

Safety improvement comes when each of these functions is performed in an integrated, effective manner. Therefore, the ISM system descriptions serve to facilitate and focus thinking and planning of an appropriate approach to safety management, and organizing and implementing the necessary follow-through activities. These descriptions are also expected to capture and institutionalize future changes and improvements to the approach during annual updates thus providing new organization members with a road-map to see the full-integrated vision.

6. RELATIONSHIP OF MAJOR SAFETY INITIATIVES TO ISM.

The Department adopts and encourages DOE Secretarial offices, field offices, and contractors to implement the principles and functions of a variety of processes and initiatives aimed at improving organizational and individual performance. Many tools and mechanisms are available and most have been or are being used in one form or

another in DOE and contractor organizations. A non-inclusive list of performance improvement programs or processes follow:

- Human Performance Improvement (HPI)
- Voluntary Protection Program (VPP)
- Behavior Based Safety (BBS)
- Enhanced Work Planning (EWP)
- Chemical Process Safety Management Systems
- Conduct of Operations (COO)
- INPO Conservative decision making
- NRC Risk-informed inspection and decision making
- ISO Standard 9001, Quality Management System
- Total Quality Management
- Six Sigma Quality Programs
- ISO Standard 14001, Environmental Management System

All of these tools, processes or approaches can be adapted to complement ISM. They share many common principles that affect organizational and individual worker, supervisor and management behavior and performance. Current guidance on these programs and processes is maintained on several internet websites, links to which are included on the www.2004-1.org Knowledge Portal. Because information on these websites is kept up to date by other organizations, this attachment does not include it because it would be quickly out of date.

In using these tools, processes, and approaches, it is important to implement them within an ISM framework, not as stand-alone programs outside of the ISM framework. These tools cannot compete with ISM, but must support ISM. The relationship between these tools and the ISM principles and functions needs to be clearly understood and articulated. To the extent that these tools help to clarify and improve implementation of the ISM system, the use of these tools is strongly encouraged. It is also critical that the vocabulary and terminology used to apply these tools be aligned with that of ISM. Learning organizations borrow best practices whenever possible, but they must be translated into terms that are consistent and in alignment with existing frameworks.

7. SAFETY PERFORMANCE OBJECTIVES, MEASURES, AND COMMITMENTS.

The purpose of safety performance objectives, measures, and commitments is to drive improvement in safety performance and ISM system effectiveness.

Performance objectives are long-term management system goals. They may be driven by strategic planning processes or safety goals processes (via DOE P 450.7). Performance objectives are expected to remain relatively unchanged over multiple years, with a bias toward continuously rising standards of performance. Improving performance is expected over the long term.

Performance commitments are specific actions that will be taken during a specific year to further achievement of long-term performance objectives. Performance commitments would be expected to address significant identified weaknesses or areas of improvement. These may include either major corrective actions or major improvement actions.

Performance measures are used to monitor achievement of performance objectives and commitments. The most useful performance measures provide information that directly reflects how safely the operational work is being performed. A combination of leading and lagging indicators is desirable. The measures are changed as necessary to best address the performance objectives, and significant identified weaknesses and areas for improvement. Annual performance expectations should be established for most of these measures.

Secretarial office ISM system descriptions should describe how ISM performance is measured and may provide a standard set of ISM performance indicators. This should be included in the section on ISM system performance objectives, measures, and commitments, and should be updated annually.

The following are sample topics for DOE performance objectives, measures, and commitments:

- ISM System Effectiveness
- Work Planning
- Feedback and Improvement
- Effectiveness Reviews of Completed Corrective Actions
- Safety Issue Reporting
- Management Walk-Through Program
- Assessment and Oversight Program
- Self-Assessment

- Vital Safety System Assessments
- Clear Roles and Responsibilities
- Human Resource Management
- Employee Training and Development
- Minority/Differing Professional Opinion
- Subcontractor Safety Performance
- Electrical Safety
- Criticality Safety
- Safety Basis Document Upgrades
- Project Controls and Baseline Management
- Project Management System
- Workforce Management
- Environmental Compliance
- Occupational Safety and Health
- Radiological Safety
- Pollution Prevention/Energy Efficiency

The following are sample performance objectives:

- Be recognized for operational excellence.
- Be recognized for excellent personnel.
- Achieve zero organizational accidents.
- Be recognized for excellent safety culture.
- Senior leadership commitment to safety is clear and visible.
- Establish and sustain a robust safety culture, consistent with HRO attributes.
- Fully integrate human performance improvement initiatives into ISM systems

The following are sample performance measures:

- Issue Assessment and Oversight Schedule by September 30th.
- Complete 95% or greater of annually planned assessments.
- Complete 90% or greater of identified employee qualifications on time.
- Implement line manager walk-around program such that line managers spend at least 100 hours individually in the field each year.
- Define work scope priorities and communicate them to contractors by July 31st of each year to guide annual work planning.
- Review corrective actions monthly with the contractor for any cost or schedule variance which is greater than a negative 10%.
- Conduct monthly all-employees meeting with an emphasis on safety.
- Implement Differing Professional Opinion procedure and train employees.

The following are sample performance commitments:

- Train employees on ISM system revisions
- Conduct ISM Verification
- Conduct 2 safety system assessments.
- Maintain Voluntary Protection Program STAR Status
- Improve total recordable case rate

8. ON CHANGING VALUES AND BEHAVIORS.

In many cases, you will find that the desired ISM system will require changes to existing employee values and behaviors. Changes in values can not be dictated and, if possible, can only be brought about by concerted effort directed toward changing behaviors. To change behaviors, and ultimately values, it is necessary to do the following:

- Clearly define the desired behaviors in terms that the target audience can fully understand and appreciate.
- Establish consensus among the senior leadership regarding the desired behaviors and obtain their commitment to fully support the desired changes.
- Identify any actions or changes on the part of senior leadership to achieve the desired behaviors and obtain their buy-in to these actions.

- Identify existing organizational processes and behaviors that may be counter to the desired behaviors and develop actions to align existing processes and behaviors with new desired behaviors; take actions to eliminate or minimize the influence of forces that may be restraining achievement of the desired behaviors.
- Clearly communicate the desired behaviors to the target audience, and provide training as needed for the audience to master the desired behaviors.
- Encourage employees to ask questions to clarify intentions, and provide feedback and suggestions on achieving the desired behaviors.
- Working with members of the target audience, develop the necessary tools and supporting structures and processes, so that the desired behaviors can be consistently performed.
- Provide consistent, visible senior leadership attention and focus on new desired behaviors.
- Align rewards and incentives programs with desired behaviors.
- Provide positive reinforcement to employees performing desired behaviors, and not to employees who are not performing the desired behaviors.
- Monitor performance and continue to provide direct, timely and specific feedback to employees regarding their behaviors.
- Periodically evaluate progress toward institutionalizing the desired behaviors and take actions necessary to continue progress.
- Communicate and train all new members, especially new leaders, on the desired behaviors, their objectives and bases.
- Continue, over and over, all of the above without restraint for at least 5-7 years until the newly desired behaviors are well ingrained and institutionalized.

GUIDELINES FOR IMPROVING DOE ISM SYSTEM IMPLEMENTATION

1. ANNUAL ISM EFFECTIVENESS REVIEW PROCESS.

The Annual ISM effectiveness review process is an essential element of ISM implementation that allows for taking evaluating implementation and making necessary adjustments. The Annual ISM effectiveness review is a qualitative review that involves multiple elements, including review against quantitative performance measures. Elements of this review should be ongoing throughout the year, and should culminate in a review report that supports an annual summary evaluation. The purpose of the annual ISM effectiveness review is to:

- Determine the effectiveness of the ISM system in integrating safety into work performance, in supporting the safe performance of work, and in improving safety performance.
- Identify strengths of ISM system implementation for sharing with other DOE elements to aid improvements at other locations.
- Identify weaknesses of ISM system implementation to focus attention on corrective and improvement actions.
- Identify opportunities for improvement in efficiency or effectiveness of the ISM system, and identify actions for continuous improvement.

For field offices, the following steps are recommended to constitute the annual review:

- Review the annual ISM review(s) and summary evaluation(s) performed by the contractor(s).
- Review the safety performance of the contractor(s) against the previous year's Safety Performance Objectives, Measures, and Commitments.
- Review the overall safety performance of the contractor(s), including results from various streams of feedback and improvement information.
- Review results of line oversight of the contractor(s); these line oversight reviews can and should be conducted throughout the year, as required by DOE Order 226.1, *Implementation of Department of Energy Oversight Policy*.
- Review the completeness and accuracy of the ISM System Description of the contractor(s).
- Determine whether a major ISM assessment of the contractor(s) is needed.

- If full, formal ISM assessment is needed, perform it using guidance below.
- If full, formal ISM assessment is not needed, document review and conclusions regarding effectiveness of the ISM program implementation by the contractor(s), basis for conclusions, strengths and weaknesses and areas for improvement.
- If more than one contractor, look at all ISM program performance across all the contractors to identify and document any generic or broad-based strengths or weaknesses or areas for improvement.
- On DOE side, review self-assessment results regarding DOE ISM performance; these self-assessment reviews can and should be conducted throughout the year.
- Review DOE site office performance against the previous year's Safety Performance Objectives, Measures, and Commitments.
- Review the completeness and accuracy of the ISM System Description of the DOE field office, and make necessary changes. Determine whether an update is necessary. If an update is made, prepare a summary of changes.
- Review integrated DOE/contractor safety performance, including results from various sources of feedback and improvement information, including external and independent oversight findings.
- Based on all the prior reviews, reach an overall conclusion regarding the state of ISM effectiveness: (1) ISM is not being effectively implemented, (2) ISM is being effectively implemented, but noteworthy weaknesses need to be addressed, or (3) ISM is being effectively implemented. Provide the basis for this summary evaluation. Provide any immediate corrective or compensatory actions that must be taken.
- Prepare the annual summary evaluation report that documents the overall review process and conclusions regarding effectiveness of ISM system by the DOE office, basis for conclusions, strengths and weaknesses and areas for improvement, and corrective and improvement actions, with schedules for completion.

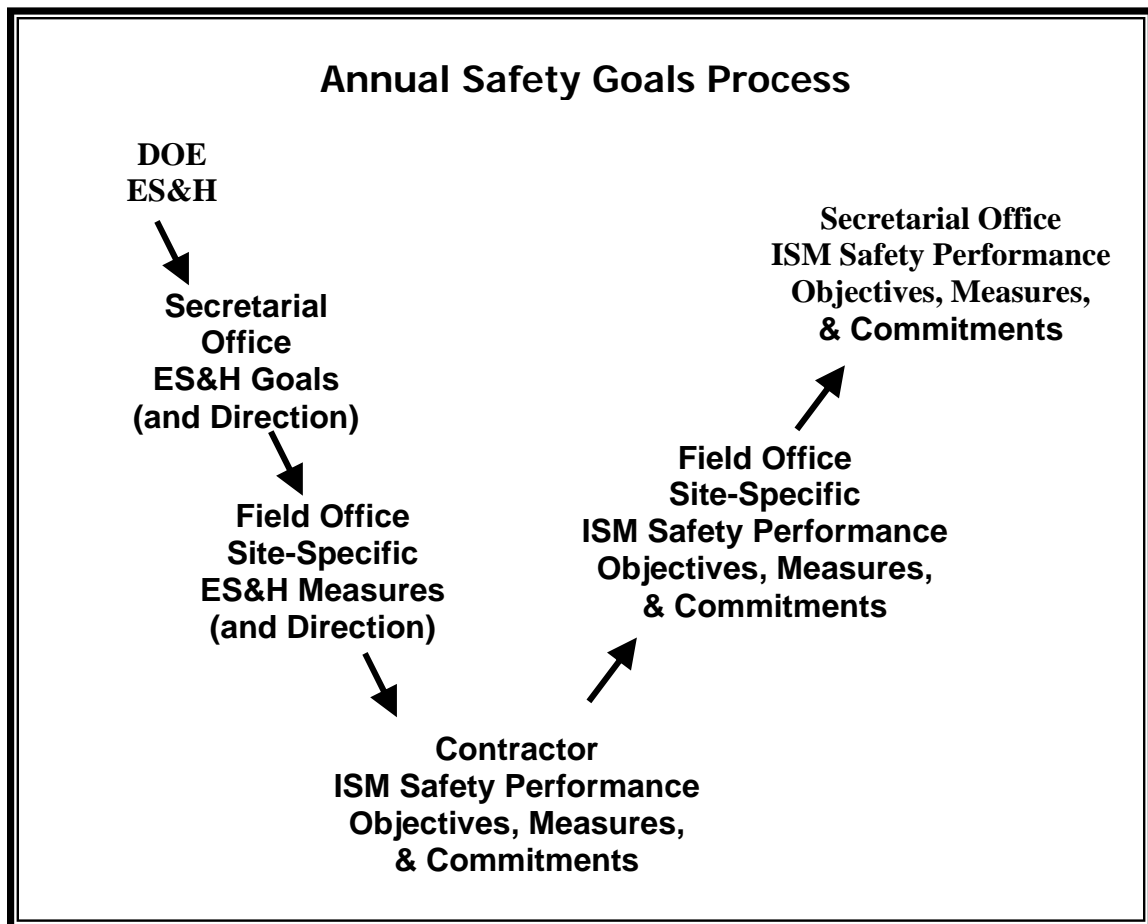
For Secretarial offices, similar steps should be taken, first reviewing the DOE site office ISM reviews and summary evaluations, etc. The Secretarial office should establish an overall schedule for annual reviews, so that annual contractor reviews and updates are all completed at the same time, and annual field office reviews and updates are all completed at the same time. This is necessary to allow for annual roll-up reviews across contractors and across field offices.

DOE G 414.1-1, *Management Assessment and Independent Assessment Guide*, and DOE DOE-HDBK-3027-99, *Integrated Safety Management Systems Verification Team Leader's Handbook*, provide additional information relevant to DOE ISM assessments.

2. ANNUAL SAFETY PERFORMANCE OBJECTIVES, MEASURES, AND COMMITMENTS.

Each year, DOE field and Secretarial offices should develop ISM Safety Performance Objectives, Measures, and Commitments. The purpose of these is to set specific goals for key improvement initiatives and key safety performance metrics.

DOE P 450.7, *Environment, Safety and Health Goals*, establishes policy expectations that Secretarial office ES&H performance goals will be established annually, and site-specific ES&H performance measures will be established annually to drive performance improvement or maintain excellent performance. The DOE's ultimate ES&H goal is zero accidents, work-related injuries and illnesses, regulatory enforcement actions, and reportable environmental releases. This goal is to be pursued through a systematic and concerted process of continuous performance improvements using performance measurement. The ES&H goals are expected to drive performance excellence, thereby reducing or precluding other work-related injuries and illnesses, and adverse impacts to the public and environment.



The annual ES&H safety goals and metrics, established in accordance with Policy 450.7 must be fully integrated with the ISM Safety Performance Objectives, Measures, and Commitments. The following process is recommended:

- Secretarial offices will establish and communicate Secretarial ES&H performance goals, based on the established DOE ES&H performance goals.
- Secretarial offices may also provide direction to its field offices regarding expectations for their site-specific ISM Safety Performance Objectives, Measures, and Commitments.
- Field offices may also provide this information and direction to its contractors for input into site-specific ES&H performance measures.
- Field offices will develop their site-specific ES&H performance measures in response to Secretarial office ES&H performance goals and direction.
- Field offices may provide direction to its contractors on their contract-specific ISM Safety Performance Objectives, Measures, and Commitments.
- Contractors provide their contract-specific ISM Safety Performance Objectives, Measures, and Commitments for DOE field office approval.
- DOE field offices provide their site-specific ISM Safety Performance Objectives, Measures, and Commitments for DOE Secretarial office approval.
- DOE Secretarial offices provide their Secretarial-office ISM Safety Performance Objectives, Measures, and Commitments for approval by the senior DOE official responsible for the DOE Secretarial office.

The timing of this annual process should be coordinated with the budget cycle, so that safety inputs to the budget process are made at an appropriate time to have an impact on future resources. The Secretarial office should establish and communicate an appropriate schedule to coordinate with the budget cycle. Once established, this schedule should be maintained, to the extent practicable, so that the annual process is predictable and manageable.

3. FULL ISM ASSESSMENTS OR VERIFICATIONS.

DOE-HDBK-3027-99, *Integrated Safety Management Systems Verification Team Leader's Handbook* (June 1999) provides extensive direction and guidance on how to conduct full ISM verifications. DOE offices should use this direction and guidance in the conduct of full ISM verifications.

Full ISM verifications need to be conducted at each site periodically, on a staggered schedule throughout the complex, to determine whether program implementation of requirements is consistent with the Department's vision. Full ISM verifications must be

performed at least every 5 years. More frequent full verifications may be appropriate where significant system or performance weaknesses are identified.

Some sites and field offices may decide and have decided to conduct full verifications every year. For these sites, the periodic full verifications will not differ significantly from the annual reviews. In general, full verifications differ from annual reviews as follows:

- Full verifications are led by a team leader who is not from the organization being reviewed.
- Full verifications have several team members who are not from the organization being reviewed.
- Teams for full verifications are typically at least 6-8 members, whereas annual reviews can be done with smaller teams.
- Full verifications are more intensive and more comprehensive, covering ISM system implementation in more depth than annual reviews.

The scope of these full ISM assessments is both the DOE site office and the associated site contractors. A representative appointed by the DOE Secretarial office should be part of the team, looking at the DOE site office ISM program. The field office manager may appoint a qualified team leader for regularly-scheduled full ISM assessments. The Secretarial office would appoint the team leader, if the Secretarial office determined that a “for-cause” ISM assessment was necessary.

It is a good practice to include team members from other Secretarial offices to foster shared learning.

4. CONDITIONS THAT WOULD CAUSE DOE TO REQUIRE A FULL ISM VERIFICATION.

Under certain conditions, DOE may determine that one or more of its contractors need a full or partial ISM verification, in scope well beyond the typical annual ISM review. Similarly, under certain circumstances, DOE Secretarial offices may determine that one or more of its field offices need a full or partial ISM verification, in scope well beyond the typical annual ISM review.

Conditions and considerations that could lead to some portion of or a complete ISM re-verification include:

- Loss of confidence in the existing ISM system description or its implementation, Significant revisions in the ISM system description,
- Significant safety problem or deterioration in safety performance,

- Significant findings from either OA or external reviews, calling into question the adequacy of the existing ISM system and implementation,
- Significant changes in mission, such as a change from design/construction to operations or a change from operations to decontamination/decommissioning.
- Significant changes in leadership personnel, such as a new site contractor, and several changes in the DOE management team.

5. CONTINUING CORE EXPECTATIONS.

The following continuing core expectation (CCE) statements are a compendium of relevant topics that can be used to aid in maintaining ISM systems and in developing an evaluation of the effectiveness of the ISM system. This listing may be used by both contractors and DOE.

- CCE-1. The contractor updates the safety performance objectives, performance measures, and commitments, in response to DOE direction and guidance, so that they reflect and promote continual improvement and address major mission changes, as required. The ISM system description is updated and submitted for approval as scheduled by the contracting officer.
- CCE-2. System effectiveness, evaluated as described in the contractor's ISM system description, is satisfactory. Safety performance objectives, performance measures, and commitments are met or exceeded, and they are revised as appropriate for the next year.
- CCE-3. Work activities reflect effective implementation of the functions of ISM system. Work is defined. Hazards are identified. Actions to prevent or eliminate the hazards are taken. Controls are developed and implemented. Work is properly authorized. Work is accomplished within controls. Appropriate worker involvement is a priority.
- CCE-4. Contractor and DOE implementing mechanisms are established and implemented to provide an effective environment for ISM implementation, as embodied in the ISM guiding and supplemental principles. Roles and responsibilities are clear. Line management is responsible for safety. Required competence is commensurate with responsibilities and the technical and safety system knowledge of managers and staff continue to improve.
- CCE-5. Contractor and DOE budget processes ensure that priorities are balanced. Budget development and change control processes ensure that safety is balanced with production. Facility procedures ensure that production is balanced with safety.
- CCE-6. An effective feedback and improvement process, using progressively more demanding criteria, is functioning at each level of the organization from the worker and individual activities through the facilities and the site, including the ISM

feedback and improvement process used by and within DOE. The expectations of DOE Order 226.1 are in place. Issues management is effective so that issues are identified, evaluated and closed. Issues identified in ISM system verifications and previous ISM system description annual update reviews are effectively addressed.

- CCE-7. List A/List B is reviewed and updated, as necessary, at least annually and concurrent with the budget cycle. The process for effecting changes to the standards and requirements identified in the Contract per DEAR List A and List B is being utilized and is effective. Authorization Agreements and Authorization Basis documents are maintained current. Changes in agreed upon standards and requirements are included to reflect mission changes. An effective, dynamic process to keep standards and requirements current is apparent.
- CCE-8. Relevant performance records reflect an improving ISM system. Records include routine DOE and contractor self-assessment reports, independent and focused assessment reports, incident investigations, occurrence reports, DOE PAAA enforcement action reports, enforcement activity conducted by external state and Federal ES&H agencies, and other relevant documentation that provide evidence as to the status of implementation, integration, and effectiveness of the ISM system. Feedback, improvement and change control of the contractor ISM system description is in place and effective.
- CCE-9. DOE ISM system procedures and mechanisms are in place to ensure that work is formally and appropriately authorized and performed safely in a manner that protects the public, workers, and environment from harm. DOE line managers are involved in the review of safety issues and concerns and have an active role in authorizing operations.
- CCE-10. DOE ISM system procedures and mechanisms are in place to ensure that hazards are analyzed, actions to prevent or eliminate the hazards are taken, controls are developed, and that feedback and improvement programs are in place and effective. DOE line managers are using these processes effectively, consistent with the DOE Field Office FRA and DOE FRAM requirements.

6. APPROVAL OF ISM SYSTEM DESCRIPTIONS.

Final approval of the annual ISM system description updates for field offices may be delegated to the field office managers by the Secretarial officer after the Secretarial officer approves the initial ISM system description. In most cases, it is recommended that the Secretarial officer delegates this responsibility. Field offices should provide a clear identification and description of any changes made in annual ISM system description updates at the time the field office transmits such updates to its Secretarial officer. In the course of its annual review, the Secretarial office should review changes to field office ISM system descriptions and provide any feedback that may be necessary.

CHARTER ISM CHAMPIONS COUNCIL

1. PURPOSE.

The purpose of the ISM Champions Council (Council) is to develop and sustain vital, mature ISM systems throughout the Department. The Council will promote continuous learning and improvement of ISM effectiveness throughout the DOE complex.

2. BACKGROUND.

The Department established the Integrated Safety Management program in 1996 to integrate safety into all aspects of work activities to improve safety performance and work performance. The Department implemented the ISM program and declared initial implementation was complete for most DOE activities in 2000. Through successive changes in Department leadership from 1996 to present, the Department has consistently indicated that ISM is its enduring safety management framework. DOE field office and contractor leadership have consistently supported the ISM framework, in part because it provides necessary flexibility to allow management systems to be tailored to local facilities and organizations.

After 2000, DOE leadership emphasis on ISM implementation has sent mixed messages, and, in some locations, ISM implementation has not received adequate priority. The actions that were needed to create and sustain mature ISM systems, capable of consistent self-generated improvements, have not been taken. The Department has learned that clear leadership focus and attention is needed to keep ISM vital and strong, and to achieve the objectives of ISM. This Council is intended to keep ISM as an active and ongoing leadership value and commitment.

3. DURATION.

The Council is expected to be a permanent coordinating structure, as there will always be a need and a benefit to promote cross-organizational exchange to drive continuous learning and improvement.

4. MEMBERSHIP

The DOE ISM Champion, who is designated by the Deputy Secretary, chairs this Council. To ensure the necessary leadership and commitment for reinvigorating ISM at all levels throughout the DOE organization, each DOE Secretarial office and field office shall designate an ISM Champion who will be responsible for leading ISM implementation activities at his or her office. In selecting ISM champions, organizations should bear in mind the ISM principle that line management is responsible for safety. ISM champions for program offices should be at least at the level of Deputy Assistant Secretary or equivalent. ISM champions for site offices (including operations offices,

field offices, and service centers) should be at least at the level of Assistant Manager or equivalent.

5. FUNCTIONS.

- Support responsible DOE managers in fulfilling their ISM responsibilities and requirements.
- Maintain cognizance of the overall state of ISM implementation throughout the Department.
- Provide guidance and feedback on ISM expectations, methods, and best practices.
- Facilitate communications between DOE organizations regarding ISM implementation.
- Facilitate communications and cooperation among DOE contractor organizations to improve ISM effectiveness; Obtain feedback from, provide feedback to, and promote improvements in coordination with the Energy Facilities Contractor's Group (EFCOG).
- Disseminate copies of the latest versions of ISM annual reviews and annual summary evaluations of ISM system effectiveness, including strengths, weaknesses, and opportunities for improvement.
- Sponsor and coordinate an annual ISM conference for DOE and contractor personnel to serve as a forum for sharing DOE expectations and guidance, disseminating best practices and lessons learned, developing consensus work products, and promoting the requisite environment for effective implementation of ISM systems.
- Provide recommendations and guidance on effective integration of ISM with other management systems, such as quality assurance, environmental management, and safeguards and security systems, and other DOE programs and initiatives that may impact ISM implementation.
- Identify ISM programs that are exemplary and worthy of benchmarking by other organizations.
- Promote and facilitate continued learning about safety management from those outside the DOE community, including academe, the commercial nuclear industry, and nuclear navy.
- Provide input to the Office of Environment, Safety and Health on DOE directives and standards regarding ISM.
- Provide reports to Department management on the overall state of ISM implementation, identify strengths and weaknesses, and areas for improvement.

- Oversee performance of the Department's ISM commitments to the Defense Nuclear Facilities Safety Board, and provide input and guidance to produce responsive interactions.

6. SUPPORT.

The DOE Office of Environment, Safety and Health will support the Council in fulfilling its purpose and performing its functions.